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Ultrasound Examination is Mandatory in the Diagnosis and Treatment of Complications from Filler Injection: A Case Report

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ABSTRACT

We present the case of a 45-year-old female patient who developed redness of the nasal tip without other signs or symptoms the day after rhinofiller treatment. The injector performed various treatments to address this unwanted effect, but with no significant improvement. Initially, he prescribed Brimonidine gel 3 mg/g, which has vasoconstrictive action. Then, bromelain, administered orally once a day, was added to the previous treatment. Lastly, topical hyaluronidase was applied to the tip of the nose every 4 days to 5 days for a month. After 15 weeks, a consultation at our center to treat complications was requested. An ultrasound examination revealed an HA accumulation on the nasal tip compressing the dorsal nasal arteries. This was immediately treated with an ultrasound-guided injection of hyaluronidase (15 I.U.) directly into the HA accumulation. The redness began to fade the following day and was completely gone within 5 days without any other treatment.

In conclusion, we highlight the role of ultrasound examination in diagnosing complications from filler injection. This examination should be performed immediately when a complication appears, without delay in pursuing alternative treatments. Ultrasound examination is also essential in treating filler complications, allowing visualization of filler accumulation and guiding the direct injection of a minimal amount of hyaluronidase into it.

Keywords: Ultrasound examination; Rinofiller; Rinofiller complications; Ultrasound-guided hyaluronidase injection

INTRODUCTION

In recent years, Non-Surgical Rhinoplasty (NSR) has increased significantly, accompanied by a rise in complications, some of which may be severe [1-7]. The nose is particularly vulnerable to filler-related vascular events because of its dense vascular network, supplied by branches of both the internal and external carotid

arteries [5,8,9], and its frequent anatomical variations [2,8,10]. Nasal tissue comprises clearly defined anatomical layers: epidermis and dermis, superficial subcutaneous fat, fibromuscular layer (nasal muscles), deep areolar fat, perichondrium/periosteum, and osteocartilaginous structures as the deepest layers [10,11]. The average nasal soft-tissue thickness ranges from 2.63 mm to 5.47 mm (average 4.00 mm), with variations between the radix (4.38 mm), dorsum (3.39 mm), and tip (4.24 mm) [5]. Male patients generally exhibit greater thickness [5,10,11]. The growing focus on safety has promoted the integration of high-frequency ultrasound into aesthetic practice [1,2,8,10]. This device enables detailed assessment of tissue structure and blood vessel patterns (Figure 1), optimizing both the planning and execution of treatments in a highly personalized way and thereby enhancing the precision, efficacy, and safety of the procedure [8].

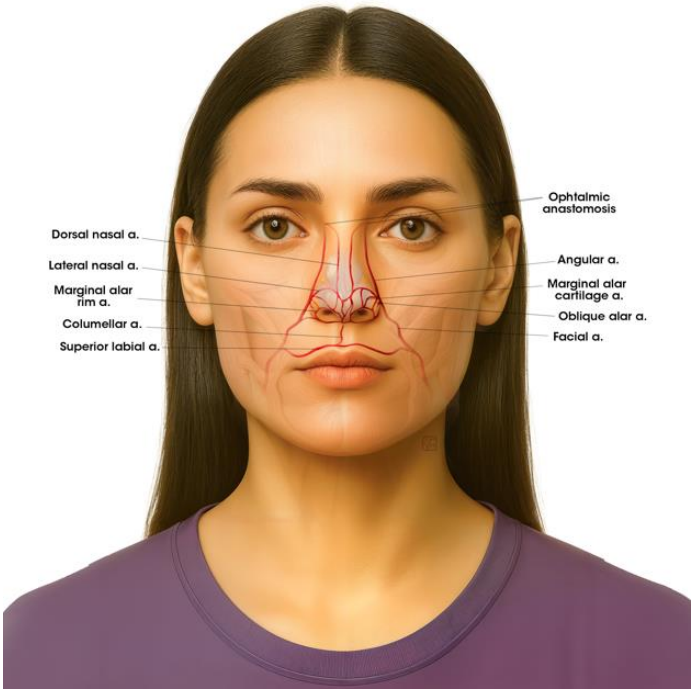


Figure 1: Blood vessel pattern of the nose.

The nasal vessel pattern is a typical example: although vessels are often superficial in the nasal tip, ultrasound studies have also shown their presence in the deep midline planes [6,8,9], raising questions about the presumed safety of deep perichondrial injections. Vascular complications (ischemia, necrosis, visual impairment, and even stroke) pose the greatest risk of NSR [2,9,11]. The nose, glabella, and forehead are most frequently associated with severe visual complications due to direct anastomosis with branches of the ophthalmic artery [2,6]. Traditional preventive maneuvers (aspiration, digital compression) do not eliminate the risk, especially in the presence of anatomical variants [6,8,11,12]. Ultrasound is therefore confirmed as an essential tool in NSR [1,2] enabling dynamic visualization of anatomical structures and ultrasound-guided injection in safe planes [6,8,10]. This study aims to describe the management of a delayed vascular complication resulting from non-surgical rhinoplasty (rinofiller) and to illustrate the role of ultrasound imaging in its resolution.

Description of the clinical case

A 45-year-old female patient presented to us 15 weeks after receiving rhinofiller treatment, during which 0.5 mL of Hyaluronic Acid (HA) was injected into her nasal tip. The product used had a high G' (about 300 Pa), high

cohesiveness, a 25 mg/mL HA concentration, and a 0.3% lidocaine concentration. The syringe supplied with the HA, equipped with a 25G/25mm needle, was used for injection. No signs or symptoms were reported during or immediately after the procedure. Redness of the nasal tip developed the day after treatment and persisted for the following days without other signs or symptoms (Figure 2). Initially, the treating physician prescribed Brimonidine gel 3 mg/g, a vasoconstrictor [13], applied to the affected area once daily. After a few weeks with no noticeable results, bromelain was added to the previous treatment and administered orally once daily. However, two months later, as the redness remained unchanged, topical Hyaluronidase (HYAL) was applied to the nasal tip every 4 days to 5 days for a month. Finally, the patient requested our consultation. Upon arrival (Figure 3), we performed an ultrasound exam, which revealed an HA accumulation on the nasal tip compressing the distal anastomotic artery of the dorsal nasal arteries and blocking blood flow (Figure 4). Consequently, an ultrasound-guided HYAL injection of 15 I.U. was immediately performed directly into the HA accumulation (Figure 5,6) using a 1 mL insulin syringe with a 30G × 25 mm needle. This single treatment, with no post-HYAL side effects and no need for further treatment, resulted in resolution of the complication, which began the day after treatment and was completed within five days (Figure 7).



Figure 2: Redness of the nose tip the day after hyaluronic acid filler injection. The poor quality of the picture is due to a self-taken picture by the patient showing the complication at the time of its appearance, a long time before our observation.



Figure 3: Redness of the nose tip when the patient arrived at our observation 15 weeks after the complication's appearance.

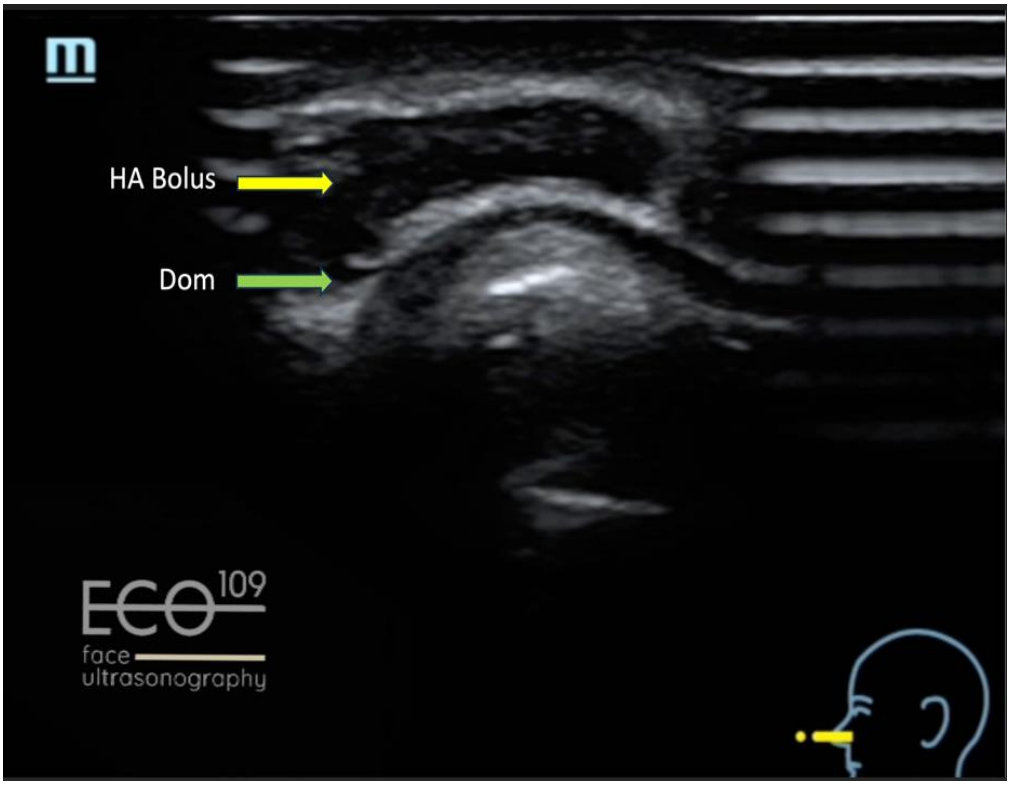


Figure 4: Hyaluronic acid nodule in the tip of the nose.

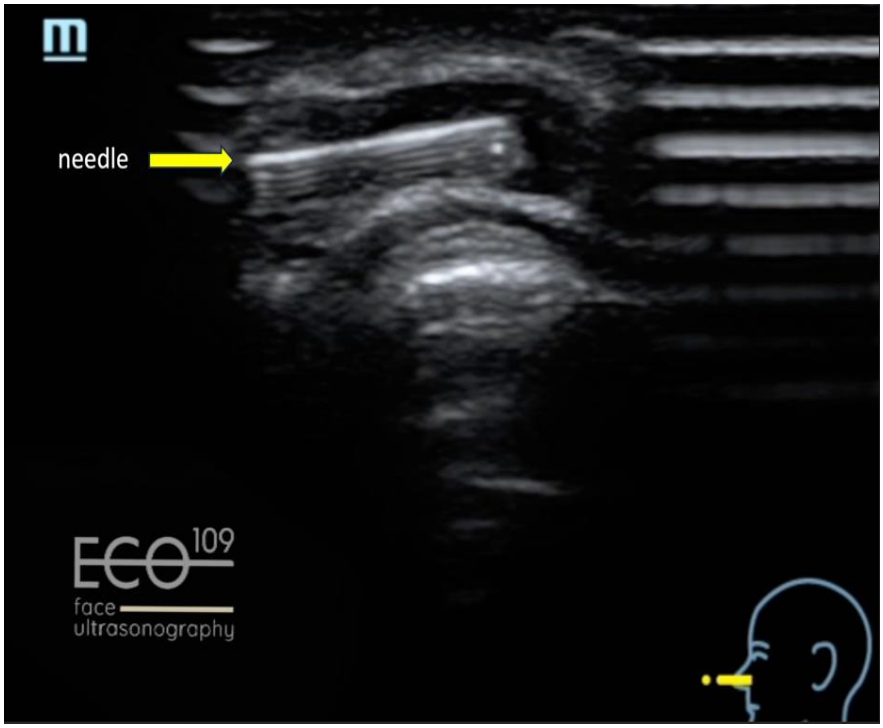


Figure 5: Ultrasound-guided introduction of a 30G × 25mm needle.

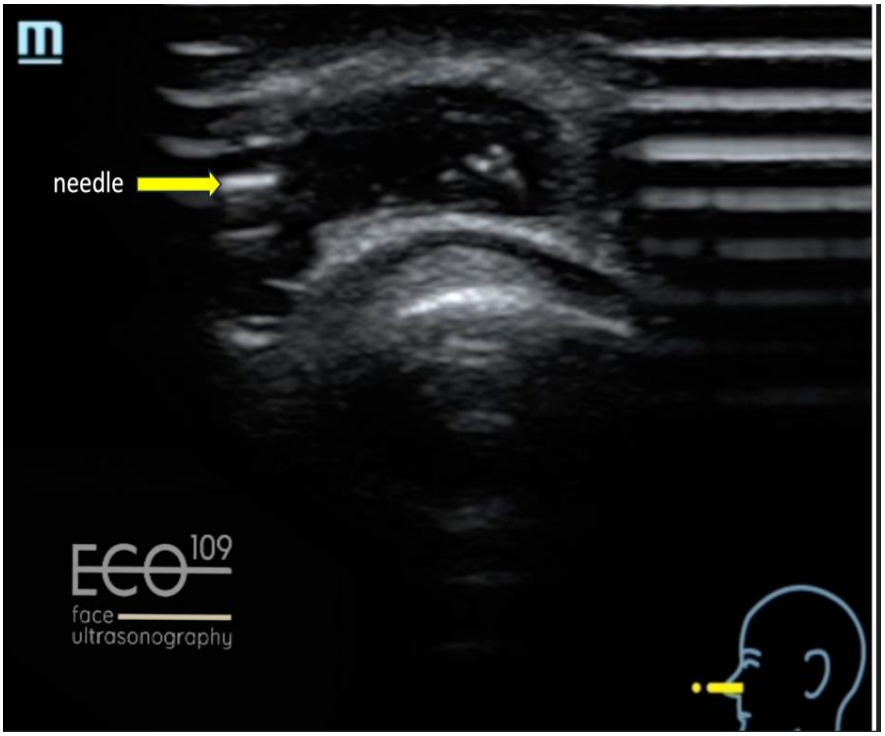


Figure 6: Injecting HYAL 15 UI.



Figure 7: Redness of the nose tip disappeared in 5 days after treatment with full restitution to a normal situation.

DISCUSSION

This case illustrates several key aspects:

- The complication resulted from vascular compression of the distal anastomotic artery of the dorsal nasal arteries, occurring after rhinofiller treatment with HA. This area is considered a high-risk zone for filler injections [14]. Therefore, preoperative ultrasound assessment is recommended.
- Filler complications can result from various factors, including incorrect injection technique, an improper injection plan, an unsuitable product for the area, excess product, an incorrectly assessed patient medical history, or other unpredictable causes [15]. In this case, the excessive amount of filler injected, combined with the high density of the gel used, may have contributed to the persistence and severity of the compression. Typically, when performing the rhinofiller procedure, it is recommended to use a highly viscous, projecting hyaluronic acid gel that enables the doctor to achieve satisfactory results with very low product doses [4,5,16]. In this way, it is possible to limit the risk of vascular compression, a likely consequence of placing a filler bolus in a widely and complexly vascularized anatomical area, such as the nasal area [2,3,4,11].
- It is also noteworthy that, despite the filler causing evident vascular compression, the patient did not report other symptoms such as swelling, pain, or acute discomfort, which are often immediate warning signs of a vascular complication [17]. This underscores a crucial point: the symptoms of a vascular complication do not always appear immediately but can occur several hours after treatment [1].
- We find it inappropriate that the initial approach to managing complications focuses on alleviating symptoms rather than addressing their root cause. Often, we assess redness only by its superficial appearance, overlooking a deeper evaluation that could identify its trigger, which may be vascular and

thus considered severe, as in this case. After three months of topical therapy without resolution and with the redness unchanged, the need for a more focused and thorough approach became clear. In practice, ultrasound guidance has proven essential for pinpointing the cause (the HA bolus) and treating it with an ultrasound-guided HYAL injection. This method permitted the use of a much lower HYAL dose [1,2] compared with guidelines that recommend extensive flooding of the complication site with high doses of HYAL (450 IU to 1500 IU/hour) over multiple sessions [18-21]. A lower HYAL dose reduces the risk of side effects. Scientific literature shows that injecting large amounts of HYAL or administering non-targeted injections can cause adverse effects such as tissue irritation, pain, burning, discomfort, redness, swelling, itching, tissue laxity, and, in severe cases, allergic reactions, which tend to be dose-dependent [22,23]. Furthermore, directly injecting HYAL into the hyaluronic acid bolus resulted in immediate improvement of symptoms and complete resolution after a few days, a success not always achieved with the traditional "flooding" protocol [1]. Despite its clear benefits in aesthetic medicine, ultrasound has limitations due to equipment costs and the need for specific technical skills for accurate image interpretation.

CONCLUSIONS

Ultrasound is increasingly essential in aesthetic medicine, as it improves the management of vascular complications, guides safer, more accurate injections, and elevates clinical standards. Despite some limitations, it is establishing itself as a vital tool, paving the way for a more modern, safe, and effective aesthetic medicine.

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Contribution: SUU wrote the first draft. All co-authors contributed suggestions and comments. SUU and GM created a final version, which was approved by all co-authors.

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